Claims:

1. A method of controlling operation of a wireless communication device configured in a zero intermediate frequency (ZIF) architecture including a DC feedback control loop and a gain feedback control loop, comprising:

processing energy in a wireless medium to generate a corresponding receive signal;

monitoring the receive signal via a predetermined measurement window;

detecting a changed condition in the wireless medium;

holding the gain feedback control loop at a constant gain level after detecting the changed condition; and

operating the DC feedback control loop in an attempt to search a stable DC value for the receive signal while the gain feedback control loop is held constant.

2. The method of claim 1, further comprising:

said processing comprising processing noise energy in the wireless medium while no packets are being transmitted;

said detecting a changed condition comprising detecting DC saturation of the measurement window;

said operating the DC feedback control loop comprising adding opposite polarity DC to the receive signal to reduce DC level of the receive signal until the measurement window is no longer DC saturated; and

when the measurement window is no longer DC saturated, operating the DC feedback control loop to control the DC level of the receive signal and releasing the gain feedback control loop to control power level of the receive signal to a predetermined target power level.

3. The method of claim 2, further comprising:

detecting gain saturation in which the measurement window is clipped at both of predetermined minimum and maximum values above a predetermined clip rate and relatively balanced between the predetermined minimum and maximum values; and

operating the gain feedback control loop to perform a clip-step procedure to reduce gain of the receive signal.

4. The method of claim 3, wherein said clip-step procedure includes using a graduated clip gain adjustment in which gain is adjusted based on an amount of clipping of the receive signal.

5. The method of claim 1, further comprising:

said processing comprising processing noise energy in the wireless medium while no packets are being transmitted;

operating the gain feedback control loop until a noise floor gain value is determined; and

storing the noise floor gain value.

6. The method of claim 5, further comprising:

said detecting a changed condition in the wireless medium comprising detecting an end of transmission of a packet in the wireless medium;

retrieving and applying the stored noise floor gain value in the gain feedback control loop;

said holding the gain feedback control loop at a constant gain level comprising holding the gain at the retrieved noise floor gain value during a predetermined quiet period; and

after expiration of the quiet period, releasing the gain feedback control loop.

7. The method of claim 6, further comprising:

prior to transmission of the packet, determining a DC noise value of the DC feedback control loop;

storing the DC noise value; and

after detecting an end of transmission of the packet in the wireless medium, retrieving and applying the DC noise value to the DC feedback control loop.

8. The method of claim 5, further comprising:

said detecting a changed condition in the wireless medium comprising detecting an end of transmission of a packet being transmitted in the wireless medium;

said holding the gain feedback control loop at a constant gain level comprising retrieving and applying the stored noise floor gain value in the gain feedback control loop for a predetermined period of time; and

determining whether the DC feedback control loop converges to a stable DC level within the predetermined period of time.

9. The method of claim 8, further comprising:

determining that the wireless medium is busy if the DC feedback control loop does not converge to a stable DC level within the predetermined period of time.

10. A method of operating a wireless communication device to perform initial acquisition of a packet being transmitted in a wireless medium, the wireless communication device configured in a zero intermediate frequency (ZIF) architecture including a DC feedback control loop and a gain feedback control loop, said method comprising:

processing radio frequency (RF) energy in the wireless medium to generate a corresponding receive signal;

determining if a DC threshold condition of the receive signal is exceeded;

if the DC threshold condition is exceeded, holding the gain feedback control loop at a constant gain level and operating the DC feedback control loop to reduce DC of the receive signal until the DC threshold condition of the receive signal is met; and

when the DC threshold condition of the receive signal is met, operating the DC feedback control loop to control the DC level of the receive signal and operating the gain feedback control loop to control a power level of the receive signal to a predetermined target power level.

11. The method of claim 10, wherein said operating the DC feedback control loop to control the DC level of the receive signal comprises controlling the DC level to within a predetermined maximum DC level.

12. The method of claim 10, the receive signal comprising an analog signal, further comprising:

sampling the receive signal with an analog to digital converter (ADC) to generate corresponding digital samples, the ADC having a sufficient range to maintain signal integrity without covering a total potential signal range of the receive signal.

13. The method of claim 12, the digital samples ranging between a minimum value and a maximum value, wherein the DC threshold condition is exceeded when a percentage of digital samples at the minimum value or a percentage of digital samples at the maximum value exceed a predetermined threshold percentage of a total number of digital samples.

14. The method of claim 13, wherein the predetermined threshold percentage is 90 percent.

15. The method of claim 13, wherein said operating the DC feedback control loop to reduce DC comprises adding DC to the receive signal in an attempt to meet the DC threshold condition.

16. The method of claim 15, wherein said adding DC comprises conducting a step search procedure by repeatedly adding a predetermined DC amount until the DC threshold condition is met.

17. The method of claim 15, wherein said adding DC comprises performing a successive approximation DC search procedure until the DC threshold condition is met.

18. The method of claim 12, the digital samples ranging between a minimum value and a maximum value, further comprising:

detecting a gain saturation state in which clipped digital samples occur at both of the minimum and maximum levels at a rate greater than a predetermined clip ratio threshold and in which a number of digital samples at the minimum level is relatively balanced with a number of digital samples at the maximum level; and

operating the gain feedback control loop in a clipping mode while in the gain saturation state.

19. The method of claim 18, further comprising:

adjusting the gain level of the gain feedback control loop based on an amount of clipping using a graduated clip gain adjustment.

20. The method of claim 19, wherein said graduated clip gain adjustment includes a corresponding one of a predetermined plurality of gain level adjustments for each of a plurality of predetermined clip ratio ranges.

21. The method of claim 20, wherein said graduated clip gain adjustment is graduated between a high gain adjustment for a high clip ratio and a low gain adjustment for a low clip ratio.

22. A method of operating a wireless transceiver device in preparation for an expected acknowledgment packet, the wireless transceiver device configured in a zero intermediate frequency (ZIF) architecture and including a DC feedback control loop and a gain feedback control loop, the method comprising:

holding a gain level of the gain feedback control loop constant during a predetermined quiet period after transmission of a packet;

operating the DC feedback control loop during the predetermined quiet period in an attempt to resolve DC level while the gain feedback control loop is held; and

after the quiet period, releasing the gain feedback control loop to operate in a normal packet acquisition mode.

23. The method of claim 22, further comprising:

prior to transmission of the packet, storing a gain level value of the gain feedback loop; and

after transmission of the packet, retrieving the stored gain level value and holding the gain feedback control loop at the retrieved gain level value during the predetermined quiet period.

24. The method of claim 22, further comprising:

prior to said transmitting a packet, storing a DC value of the DC feedback control loop; and

applying the stored DC value after transmitting the packet.

25. A method of operating a wireless communication device to determine clear channel assessment of a wireless medium, the wireless communication device configured in a zero intermediate frequency (ZIF) architecture and including a DC feedback control loop and a gain feedback control loop, the method comprising:

storing a gain level value of the gain feedback control loop;

detecting a packet being transmitted;

after transmission of the packet is completed, retrieving the stored gain level value and holding the gain feedback control loop at the retrieved gain level value;

operating the DC feedback control loop to search a stable DC level; and

determining whether the DC loop converges to a stable DC level.

26. The method of claim 25, wherein said storing a gain level value is performed while no packets are being transmitted via the wireless medium.

27. The method of claim 25, further comprising:

storing a DC value of the DC feedback control loop prior to said detecting a packet being transmitted; and

applying the stored DC gain setting after packet transmission.

28. The method of claim 25, further comprising:

holding the gain level of the gain feedback control loop constant during a predetermined quiet period; and

releasing the gain feedback control loop after the predetermined quiet period to operate in a normal mode.

29. The method of claim 25, further comprising:

determining if the DC feedback control loop converges to a stable DC level within a predetermined period; and

if the DC feedback control loop converges within the predetermined period, operating the DC feedback control loop and the gain feedback control loop in a normal mode.

30. The method of claim 25, further comprising:

determining that the wireless medium is busy if the DC feedback control loop does not converge to a stable DC level within a predetermined period of time.